

CACTUS AND SUCCULENT JOURNAL

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W. Taylor Marshall, the author of the Illustrated Glossary, on a scientific expedition in Lower California, Mexico. The cactus is *Cochemeia halei*.



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PRESIDENT'S MESSAGE

The most engrossing subject of the day is Cactus and Succulent Show plans. Everywhere I go I hear whispers of something good that is being groomed for the show. For the first time in our history the show will be held under canvas in a large tent in the gardens of Paul J. Howard's Flowerland and Nursery at Third and La Brea Streets, Los Angeles. If you have not already done so, mark the dates in red, May 14 to 17, inclusive.

There is still room for all kinds of exhibits. Entries of one or a few choice plants are just as welcome as the large exhibits though we will need a few new large ones to take the place of two of last year's leaders as their collections have been broken up. There is no entry fee. A card to the Schedule Committee, C. & S. Society, 6162 N. Figueroa St., Los Angeles, will bring a copy of the schedule and an entry blank.

Notice of the April meeting is given below.

Cactus & Succulent Day at the California Pacific International Exposition, San Diego, will be Sunday, July 28th. Cactus and Succulent talks will be given in the auditorium of the House of Hospitality on that evening and the preceding evening.

HOWARD E. GATES.

AFFILIATED SOCIETIES

I take great pleasure in announcing a paper written by Wm. Taylor Marshall entitled, "Some Notes on Sonora, Mexico, and Her Cacti." This paper is a transcript of a talk by Mr. Marshall given before the Cactus and Succulent Society of America. The author has told the story of his trip into Mexico in a very interesting manner. Although the account is full of very important information for lovers of cacti and other succulents, it is written in a most entertaining style.

This paper and those announced in earlier issues of the Journal may be procured for the use of affiliated Societies by addressing Wm. J. Surganty, Corresponding Secretary, 555 No. Ardmore Ave, Los Angeles, California.

THE GARDEN DICTIONARY. 888 pages 8x11, 521 illustrations; edited by Norman Taylor and published by Houghton Mifflin Company, San Francisco, New York, Boston. \$16.25 by subscription.

This comprehensive dictionary of gardening has been compiled with the one thought in mind: world-wide known contributors presented their expert knowledge and advice translated into the simplest possible terms. How well this was done, the book itself is proof. Written for the thousands of students and gardeners, this valued contribution will fill the need for a complete and understandable garden dictionary.

Although rare plants and new species have not been listed, this dictionary is a complete index to garden and botanical terms. "The jargon of gardeners, nurserymen, botanists, and such has not been used unless the word itself is clearly defined at its proper vocabulary entry." In other words, no other reference works are required to understand all of the terms used.

There are more succulents listed than in any other book on gardening and the Society and the CACTUS AND SUCCULENT JOURNAL are mentioned in several references. The Editor, Mr. Norman Taylor, is a member of the Cactus Society and Dr. A. D. Houghton is one of the 68 contributors. JOURNAL readers will be especially interested in the fact that Mr. Taylor has adopted the departure from the use of capital letters to start specific names whether based upon geographical adjectives, proper names or generic names; this procedure was adopted by the Journal six years ago amid much criticism, but there is no doubt that eventually this will be the recognized form which leads towards simplicity and uniformity.

This book is recommended as a necessity for all plant lovers and is one of the general gardening books recommended to those specializing in succulents. Write to the publisher for more details regarding the many features of THE GARDEN DICTIONARY. Please mention the JOURNAL.

APRIL MEETING OF THE CACTUS AND SUCCULENT SOCIETY

Sunday, April 19, we are to be the guests of the Riverside Club. 10:00 A. M. Meet at the Cactus Garden in White Park; 10:30 A. M. Middleham Garden, 2582 Seventh St.; 11:15 A. M. Satterfield Garden, 3490 Kansas Ave.; 12:15 to 1:30 P. M. Lunch in picnic grove at the Citrus Experiment Station. Coffee will be served by the Riverside Club. Remainder of the afternoon will be devoted to garden tours. In case of wet weather, the Riverside Club will provide a program in the lecture room of the Citrus Experiment Station. This meeting should prove one of the best of the year as there are many fine plants in Riverside and the Riverside members are real enthusiasts. Mark your calendar now; no other notice will be mailed.

A Cactus Collecting Expedition in South America

Report on the First 5000 km. in Argentina and S. Bolivia

By HARRY BLOSSFELD

(Translation by Mrs. Vera Higgins)

The beautiful flowers of the South American dwarf cacti of the genus *Lobivia* and *Rebutia*, which during recent years have become familiar to an increasingly large circle, and of the large-flowered *Echinopsis*, which fascinated me during my gardening apprenticeship by the indescribable colouring of their large and numerous blossoms, offered inducement enough from the horticultural and scientific point of view for the undertaking of an exploratory and collecting trip to their native home. From the horticultural point of view it was important to search for and introduce rare or new species in order to stimulate the interest of cactus lovers. From the scientific point of view it seemed desirable to obtain greater certainty on the geographical distribution, the systematic delimitation of species, the occurrence of local variations and to collect data so as to verify the correctness of the classification of those species already described. The latter task is especially important having regard to the chaotic condition of the nomenclature of the species discovered in recent years, where different opinions, with more or less scientific grounding, contend for recognition. The final incentive to the realization of the scheme for such a journey was given by the well-known Argentinian cactus collector, Herr Marsoner, who was the first to send many of the newly discovered species to Europe and who himself volunteered to make the journey jointly with me. So I very willingly took leave of absence from botanical studies, to prepare for and carry through this trip. From my horticultural experience I have gained a comprehensive idea of the most valuable cacti from the gardening point of view and of their characteristics. From long study of the classification of cacti and their areas of distribution I have the means of bringing back home with me from this trip, scientific observations of value. For valuable additions to my list of localities, arranged geographically and systematically, I have to thank the friendly collaboration of almost all the botanists interested in cacti, whilst from explorers who know the country I have received innumerable suggestions, directions, advice and introductions. Besides this, owing to the personal and business contacts of my father in South America, I have received

counsel, support and help in many places.

The localities of various species were marked on a large map of South America, the result being a route of about 20,000 km. as the crow flies, if the journey was to cover Argentina, Bolivia, Peru, Ecuador, Chile, Uruguay, Paraguay and Brazil. In view of the magnitude of this scheme I had to restrict the route to the chief areas of distribution. But even this plan had to be changed several times during the journey, when we came by chance on new localities which led us far from the pre-arranged route, if we were to explore them thoroughly. The easily accessible cactus regions along the main railway lines had already been "worked out" by other cactus collectors. So I proposed to make my journey with a small 2 ton lorry, which certainly was very tiresome and timewasting, but, in spite of this, promised better results, for only thus could we thoroughly investigate the remotest regions not yet explored and there find valuable new plants and rarities. I therefore bought, after a thorough try out, a 4 cylinder Ford lorry with closed body, so as to be able to protect our plants and luggage from rain and dust. A Ford was chosen because one can easily get spare parts for this type throughout South America, even in remote places, because this type of motor is known to meet the demands of bad roads and because the motor has a reserve of power by means of which we hope to be able to get over the Andes even. Before our departure the lorry was fitted with special contrivances for our convenience and also with thick balloon tires which travel better on sandy, unmade roads and do not sink in so deeply. Tools and a good supply of spare parts were procured, which would all prove useful, for our breakneck journeyings up hill and down dale would cause much damage. On every trip something was smashed, if it was only the mud guard, the running board, the springs, reflectors or the wind screen.

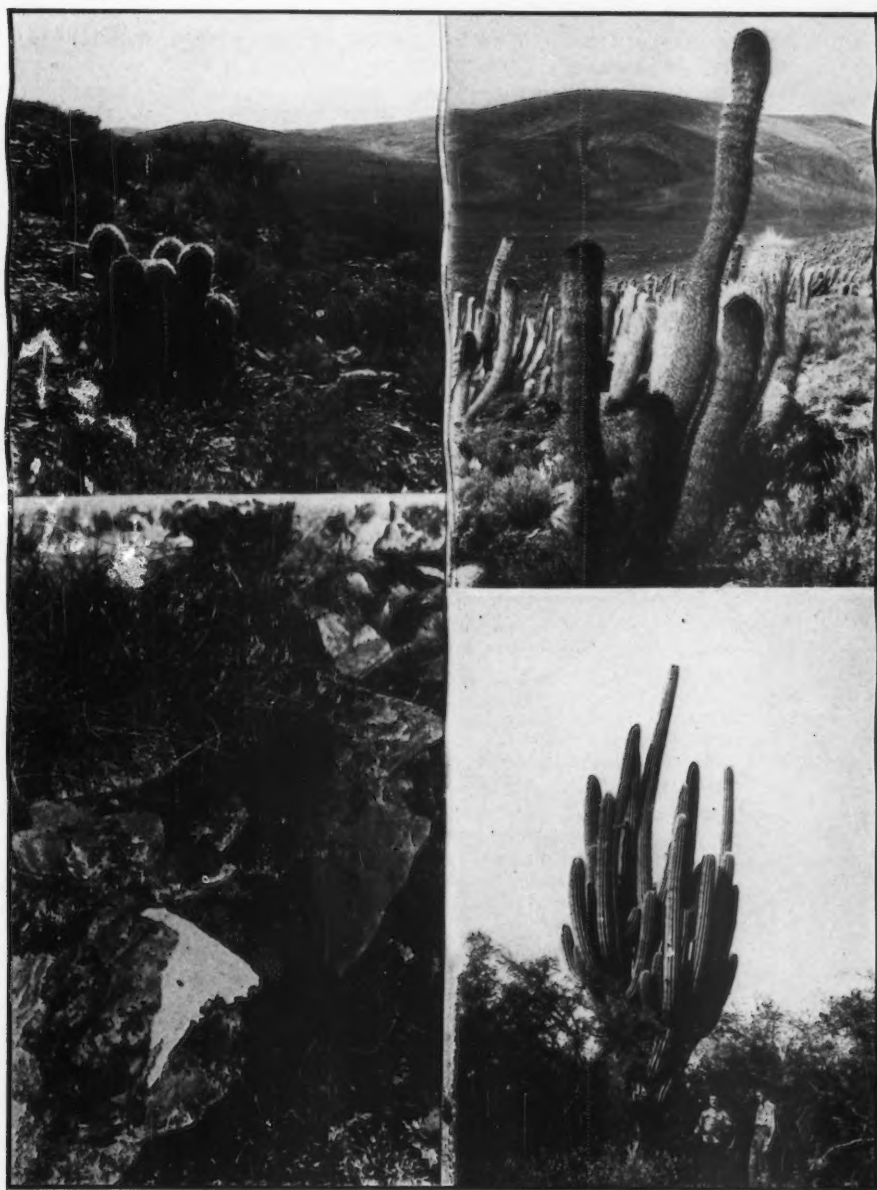
Not having much money at our disposal we had to camp in the open, wherever night overtook us. This primitive method of travelling has the advantage that one can stop at the place where the species occur and be in the position to begin work again in the cool morning hours of the following day. For the Cacti mostly grow

far from houses and settlements, on bare mountain tops and so one can save much time by this form of travel. All day we pushed on eagerly. In spite of this one advances but slowly by ways which defy description. We filled the water tank at streams and rivers, halted at likely looking places—we gradually developed a fine instinct for cactus localities—unpacked machetes, rucksacks, ice-axes, photographic apparatus and Brownings and then hunted over the ground on foot. The mountains are usually surrounded by a dense belt of thorny scrub, through which one has laboriously to work one's way. Here face and hands are badly treated and the stoutest clothing, wind jackets, rucksacks and even my so-called "thorn proof" shirts are torn to shreds. We soon learned to know from experience all the other pleasures, large and small, of cactus collecting. For instance, when there is a wasp's nest in a cactus which one has got to collect, or ants in the food stores; then again, enormous stones or trees have to be removed from the road, a broken bridge necessitates the fording of a river, where the lorry has almost learnt to swim, or a breakdown in a remote district. When collecting in the neighborhood of Trancas, north of Tucuman, we were attacked by a microscopic kind of mite which lives on shrubs and undergrowth; this penetrated our skins and set up violent irritation. It could not be removed by any means, but appeared to die of cold in the icy mountain nights, high up in the north. Another time we found a snake which we wished to send to the Zoological Garden at Buenos Aires. We shut it in a box and when Herr Marsoner one morning wanted to see how it was getting on, it struck with its head and bit his inquisitive, outstretched nose so that the blood spurted! Luckily it was not poisonous!

When we appeared unexpectedly in a large town in our well-torn travelling kit, with the lorry piled up with luggage, we were invited by a police sergeant in the most friendly way to go to the police station with our lorry. Our consciences were not entirely clear, for the hunting guns were in the wagon and we had no permit to hunt. On the driver's seat lay my large Browning, another hung in the haversack on the side. We went rather anxiously, with a policeman as guide on the running board. The chauffeur trod on the gas, in the quiet hope that the policeman would lose his hold at a sharp turn in the road with a speed of 60 km. per hour. Unfortunately, however, we had underestimated his muscles and his persistence. We had to stop at the police station, our pockets were emptied and smiling we showed our 1001 permits. The chief station was telephoned to and we had to go up to this

station. On the way there, the arms were so thoroughly hidden by the presence of mind of the chauffeur, that they were not discovered. Then renewed examination, renewed presentation of our permits. Then each of us was decorated with a large number and we were, as was soon obvious, photographed for the criminal's register. They took three impressions of the ten fingers of each of us and immortalized them with the photographs in the criminal's gallery. After an unwilling halt of five hours we were released with a friendly laugh and even my pocket knife was returned to me. In this friendly town another European cactus collector was similarly treated. The involuntary halt at the police station had upset our plans for the day so that we could not reach the next destination till darkness had fallen and had to camp out in the bitterly cold night. We tried, however, to swear ourselves warm at least, which made it easier to sleep.

When at noon, we returned to the lorry, dead tired and sweating from our labours, the collected plants were packed up, the tent cover was spread over the cases and we journeyed on to any sheltered dry place, free from ants and snakes, where we could find a night's lodging. As soon as the sun sinks below the horizon it is night immediately, with no twilight. If we were late looking for a camping site, we had to hunt around with lanterns for firewood, if any was available. Then we made a fire, cooked macaroni or rice with tomatoes, meat paste, or with game we had caught, or there was only dry bread or ship's biscuit with Yerba. It is hard to get used to this tea, so much beloved in South America, which is prepared from the leaves of *Ilex paraguayensis*, and one first gets the real taste after one has drunk a couple of litres of this herb tea. It is very healthy and promotes long life. In this hope I drank it resignedly. After meals the crockery was washed, if there was enough water available, the chauffeur overhauled the motor, Herr Marsoner packed in the luggage, I wrote up my diary and saw to the most important correspondence and then we crept into our sleeping bags and under the covers, for the large tent cover, many times folded, served as mattress. With the top layer of the tent we kept ourselves dry; the Brownings lay ready at hand near us, close to the fire. In spite of this the great cold woke us as a rule before dawn. For in winter here towards morning the temperature on the lowlands falls below freezing point and everything is covered with frost. At greater heights the night temperature may be 15 degrees C. below zero. Then the fire is set going again, the inevitable Yerba-mate brewed; with this we have dry bread, bread and



UPPER LEFT: *Oreocereus trollii*; a large cluster north of Humahuaca. UPPER RIGHT: *Oreocereus bendrikensianus*.
LOWER LEFT: *Rebutia minuscula* near Salta. LOWER RIGHT: *Trichocereus terscheckii* in the Province of Tucuman.

EDITOR'S NOTE: The ever increasing interest in cacti and the other succulents is shown by the many articles on collecting. These collecting expeditions are bringing to light many new species and correcting past errors. Men like Harry Blossfeld, Eric Walther, Curt Backeberg, F.M. Knuth, Yale Dawson, Howard Gates, James West and a host of others are making succulent history. The next few years will see an international agreement on nomenclature.

honey or a sweet "Marmelade Dulce." This is a horribly sweet marmalade made of all possible fruits, even *Opuntia* fruits and potatoes can be recognized in it. Then we pack up with all speed, load up, fasten the cover firmly over the truck and set off to do as much as possible before the grilling heat of mid-day becomes too enervating. Washing is a luxury as it were, for it can only be managed when the camp is set near running water.

Later in the Puña (as the high plateaux of the Cordilleras at 3700-4600 m. above sea level are called), shaving was discontinued, for in the rarified air of these notorious plateaux the skin becomes so dry that it cracks and bleeds. Here the well-known Puña disease, the Soroche, is prevalent. It is caused by the reduced atmosphere pressure and low oxygen content on the body and reacts especially on the brain, the circulation and the breathing. One gets giddy, with a feeling of muscular weakness and inability to carry out voluntary movements with precision; inability to see clearly, severe headache, breathlessness and bleeding from the mucous membrane of the lungs may occur. On such an expedition into the Puña my travelling companion had to turn back half way because of hemorrhage. Even eating was hard work for us. When standing one cannot swallow a mouthful, one must either sit or lie. We had to drag along several plants weighing about 15 kg. each, which seemed to us so terribly heavy, like a whole rocky pinnacle. Another time I wanted to search a certain district, whilst my companion went on with the car. This little digression was made on mules and I hoped to get down again by evening, but was delayed and had to spend an icy night in a native hut full of bugs and covered only with old newspapers. Up above there our Polvorin, the native name of the skin mite, is killed by frost and was almost forgotten when letters from home arrived with suggestions of remedies.

Now I will report on the most important of the areas traversed up to now and on the cacti collected or discovered and erect a small memorial to our brave Ford for the brilliant demonstration of its capacity for work. For high up in Jujuy, where the people have a better understanding of the difficulties of our trips than anyone from Europe or the United States unfamiliar with the conditions in South America, our Ford as well as ourselves were regarded as wonders. Here no one would have believed a word of our tales had I not, as the surest and best proof that we really had been in all the districts that we described, been able to produce my photographs with the complete record in pictures of our journeying up to them. It appears that this

photograph album is the best letter of introduction and one which opens for us all doors amongst the very hospitable Argentinians.

After we had struggled for weeks in exasperation over the release of my equipment by the customs and acquired an idea of the meaning of the phrase "mañana" (tomorrow), after we had finally even teased the customs officer on the unbelievable slowness of his mind, we went on to the Province of Cordoba. Here we found the beautiful *Echinopsis violacea*, *E. aurea*, *Gymnocalycium*, (*Echinocactus*) *lafaldense*, *kurtzianum* and *multiflorum*. Some of these plants sent to my father at Potsdam, which he, as an experiment, sent on to Australia. News has come from the consignee that these plants, though they had made a double journey across the world, were received in Australia in perfect condition. We wanted from here to make a digression for a few days only towards the south, into the mountain chains of the Province of San Luis. But we struck such an incredibly bad road that we could only proceed very slowly. Once we stuck in the mud completely, and another time the rise was so steep that even our Ford jibbed and we had to unload, proceed empty and carry up the whole of the baggage, including several hundred kilo of Cactus plants, and reload up above. From Cordoba we sent in advance to Jujuy all the plants so far collected and all the luggage we could do without. We had not realized that it would take us three weeks to cover the awful road through San Luis. In spite of everything it was worth all the trouble. We found the white-haired *Lobivia* I had expected, to which I gave the number 19. It is probably new, but certainly the most beautiful of the *Lobivias*. We also found a dainty little dwarf *Opuntia* and the rare *Lobivia spiniflora*, whose petals terminate in fine spiny tips.

Along the only road leading westward, which was in an appalling condition, we went into the Province of La Rioja. Taken all in all it is an unutterably barren and desolate region. Here we found a terrible landscape, completely dried up, with only a few ruined houses of long forgotten human settlements. Here also we were very short of water. On the plains the vegetation was miserable. Stretches were overgrown with *Opuntia diademata* which is here almost spineless and with *Opuntia strobiliformis*. On a small Sierra we found *Gymnocalycium* (*Echinocactus*) *saglionis* and the peculiar *Echinopsis* No. 20. Our next aim was the 6000 m. high mountain, Famatima, where we hoped to find the beautiful *Lobivia famatimensis*. But at Vichigasta, a wretched village at the foot of this snow-covered mountain, our axle broke and we had to make

an unwilling stay of three weeks.

Owing to the miserable road and the overloading of the lorry the differential drive was also damaged. We employed this delay to change the lorry, previously of the closed type, into an open one by sawing off the upper part, which made possible a considerable increase in the effective load. We tied our large tent cover over the luggage space as closely as possible but, in spite of this, everything packed underneath was covered thick with dust each evening. For our car, except when it was going straight over a stony slope, was always in a high cloud of dust, since the road usually consisted of foot-deep, fine dust. During the involuntary halt we sought for *Lobivia famatimensis*, but vainly for we found only three specimens. But we did find a whole series of unknown Cacti in the high mountain regions. When the repairs were finished we travelled in a great semi-circle, first northwards, then eastwards, then southwards to Catamarca. There we found *Lobivia andalgensis* which we were the first to export; this is of slender, columnar habit with wonderful spines. We also found *Echinopsis aurea*, *Cleistocactus baumannii*, *Cereus coeruleus*, which has always been collected and exported previously in error as *azureus*, as well as *Stetsonia coryne* and again *Gymnocalycium saglionis*.

From Catamarca we went northwards into the tropical dampness of the Province of Tucuman, which is partly laid out as a single, large cane sugar plantation. In the southern part only we found two species of *Rhipsalis*. Though a storm raged behind us and rain in this region would make the road an impassible quagmire for weeks, yet we went on in spite of the bad road at an unjustifiably rapid rate over the dreadful, loose streets and even made no halt in the town of Tucuman, on to Trancas, where it was still fairly dry. Rain in the tropics cannot be compared with the greatest European rainfall. Quite suddenly, as though the first thunder and lightning had burst open a door, the rain descends from heaven like a sea released. There is no room to breathe between the deluges of water. This sea, thundering down, appears to be in flames, its flashes roar like a wild animal, the earth trembles as if she would shake herself free from the terrible thunder. Quite suddenly the rush of water ceases and one stands often knee deep in water. The storm quickly passes and one could almost believe that one had only dreamt this inconceivably grand phenomenon. So it is understandable that we tried to get away as quickly as possible from the bad weather threatening.

On this trip we broke 9 of the 10 springs of the front axle of our truck. Fortunately the last

spring held out till we reached Trancas, and in this God-forsaken village we had to set up our tent and await repairs. Here we found giant specimens up to 10 m. high of *Trichocereus terscheckii*. On shining red sandstone hills we found a *Lobivia* which may be identical with *Lobivia hyalacantha*. But, according to the not very reliable reports of the natives, it should have a dark violet flower. If this is so, it will be a new species. But there was nothing more here in the Cactus line to collect. Also the road came to an end and so we could not penetrate the western hills, in which I still expected to find cacti. We had to turn and go to Salta. In this magnificent region we found the beautiful *Echinopsis* No. 37 and the extremely rare *Parodia aureispina*. The true form of this lovely rarity with the golden spines only occurs in one single spot. It can be found in a few other places also, but the spines are only partly golden, in a degenerate or hybrid form. The true and most beautiful form grows only on one almost vertical rock wall in the cracks of the slate. I had to climb up and let myself down from above between horribly prickly clumps of *Bromelia* and a sort of succulent stinging nettle, extremely painful to touch, to hack the little *Parodia aureispina* out of the rock walls. This was the most dangerous and difficult bit of collecting that we had had to undertake so far. Our task was to ascend the sundrenched northern walls*, which was covered with wasp's nests also, as already mentioned, with a terrible stinging nettle and on the way up I disturbed a poisonous snake like a common viper, so that great caution was necessary. It is not easy to collect these small plants under such conditions. The collector who gathered them for the first time a few years ago and from whom the author received plants, returned home swollen like a barrel from wasp stings. I had to rope myself to a bottle tree, as one could not reach the plants otherwise, and so I hung defenceless on the rope, the victim of wasp attacks if I unintentionally disturbed a nest. It is understandable that I could only collect a few specimens of this beautiful species. The true, golden-spined *Parodia aureispina* will always remain a rarity.

As a result of heavy rain the previous year, many roads in the Province of Salta were wholly or partly washed away and destroyed. Hence travelling by motor was very difficult in places and many proposed expeditions could not be accomplished. On one trip through the Que-

*South of the Equator the northern walls are in sunshine whilst the southern walls are in shadow, since the seasons are the opposite of those in the northern hemisphere. In June, July and August it is winter here.

brado del Toro we and the wagon were stuck in the rushing water of the Rio Blanco. In the middle of the ford we got the front wheel into a deep hole which had been made earlier when a large lorry stuck in the bed of the river and had to be hauled out by oxen. The next day then, we too fell into this hole. The water got into the motor so that we could not get out under our own power. The current was so strong that it took all our strength to stand erect in the water. And the water was so deep that it entered the lorry so that we had to unload with all speed, to keep our luggage dry. Two horses could not move the lorry one centimeter from its place. And besides it was night, so that we were freezing and soaked to the skin, we had to make our camp on the stony shore. During the night I accidentally came on a thief, who would have stolen some of our tools. Unfortunately I had not brought my Browning on this little trip otherwise I could have stopped the thief by a shot of warning. Next morning we worked for four hours diverting the bed of the stream in which our car was stuck fast. Then we harnessed three horses, with the result that the driving rod of the lorry broke. Then it occurred to us to hitch the horses on behind and drag it out backwards. Whilst the horses pulled, we raised the front axle with a felled tree and slowly the lorry reached the shore. We spent the second half of the day drying our wet clothes in the sun. The next day we successfully crossed the river and the day following we found a beautiful yellow-flowered *Gymnocalycium* and *Lobivia* No. 38, which is firmly anchored deep in the loose stones by a very long tuberous root. This plant so strongly resembles in colour and appearance its stony environment that one can hardly see it. A number of *Rebutias* also grow in this neighborhood but only on the almost inaccessible tops of the mountains.

We finally went on to Jujuy, where a whole shed full of cases, which we had sent on in advance, awaited our arrival to be dispatched. This was a job which kept us busy several weeks. Unfortunately we had great difficulty with the despatch of the plants for the plant protection office could give no certificate of any use abroad, although we had received contrary information from the officials in Buenos Aires. It is remarkable that there is so well organized a plant protection service; whilst men afflicted with all manner of diseases can cross every frontier, plants must be inspected by the plant protection office of the country of consignment and provided with a certificate of health. On arrival they are, as a rule, inspected once again, before they can be allowed to enter. All these provisions for plants have not, however, prevented the most

dangerous pests from crossing the prescribed boundaries. Why the countries agreeing to the International Phylloxera convention of Nov. 3rd, 1881, still keep in force the whole law against Phylloxera, with its cumbersome apparatus, although after the discovery of the winged form of Phylloxera it was quite superfluous, is incomprehensible to me. Finally after a series of telegrams and express letters the plants could at last be sent off. In the meantime we took the ancient trade route northwards to Bolivia and found there a beautiful, little *Rebutia*, *Parodia*? (*Echinocactus*) *chrysacanthion*, a golden-spined local form of *Borzicactus strausii*, a tiny *Lobivia* with a worm-like root 20 cm. long, the lovely *Lobivia densispina*, the beautiful *Lobivia longispina* which is probably identical with *Lobivia ducis pauli*, as well as the fine, rare *Lobivia schubdtii*. Of the microspermus group we found *Parodia* (*Echinocactus*) *tilcarensis*, the peculiar *Parodia*? *maassii* and also *Lobivia* No. 37 though with quite different spines, then the very rare and beautiful *Lobivia famatimensis* with thick tuberous roots, which sometimes so closely resembles its surroundings that it is very hard to find. We found here too enormous groups caused by the continual cropping of skunks and goats. Having hunted for several days, we all three saw one night before our eyes, overstrained with searching, the small grayish red heads of *Lobivia famatimensis* between its native stones, similar in coloring and shape. With much regret we had to leave behind five magnificent cristates of *Gymnocalycium* (*Echinocactus*) *saglionis*, weighing 20-40 kg. Then we found the lovely golden-flowered *Rebutia senilis*, which, according to the original description, should occur about 200 km. further south, in Salta. Possibly the author has in error given the name of the town as locality, because he bought a few plants there. For if this species really occurs in Salta too, it would be the first case of a *Rebutia* having so wide a distribution. In the genus *Lobivia*, such exceptions as *Lobivia famatimensis* are known, whose localities in Famatima and in Jujuy are 700 km. apart. Also *Lobivia* No. 37 was found at two places almost 200 km. apart. But here we saw from the marked difference in the spines that they represented the outer limits of the area of distribution. We found all the other *Lobivias* and *Rebutias* without exception in very restricted areas, often on one mountain top alone. It would be interesting to establish the distribution areas of these Cactus genera which are apparently still evolving, by reliable comparisons of the true localities. In my experience the vague statements of the Argentinian Indians are as reliable in respect of localities and

areas of distribution as many of the localities of new species given in the description by the discoverer.

At more than 3000 m., where in June and July the temperature at night falls to 16°C. below zero, where rivers and streams freeze at night right to the bottom, and where next day, under the bright sun, a temperature of 20-25°C. exists in the morning, grows *Oreocereus trollii* and the lovely *Trichocereus poco*. The giant *Trichocereus pasacana* no longer occurs here. The last, gigantic snow-white stems of this species occur at 2800 m. above sea level. Further north *Oreocereus celsianus* is always found on the sunny side of a gently sloping hill, often as tremendous woods or as giant specimens. We found also for the first time a monstrous form of it, a colossus, growing like a *Cereus peruvianus monstrosus*, known as the Rock Cactus. Here the tiny *Rebutia pygmaea* creeps along deep cracks in the rocks. Even with a crowbar we often could not splinter the massive rock into which these little plants are anchored by their long, slender, tuberous roots, seeking protection from attacks by the wild llamas and from icy storms which drift across the high plateau at 3000 m. from Bolivia. Up here occurs the last *Oreocereus celsianus*, bowed before the storm.

On the high plateau of Bolivia is supposed to grow a beautiful, long-haired, giant columnar Cactus, "pelo rojo" or red hair, so named by a native, which was the chief reason for this trip. So far we had found no trace of it. Systematically whole stretches were hunted over, but unfortunately always without result. We spoke daily of turning back, for in this cold season it was more than disagreeable on the high plateau, often swept by icy storms; our food supplies had to be rationed and water too was very scarce. But we found the beautiful *Oreocereus? hendrikseni*, which raised our spirits and our hopes, especially as we were able to increase our supplies by a chance meeting with a wild lama, although even when cooked in a special steamer, the flesh could not be softened. We firmly hunted on and at last were lucky, finding it on a hill where we had not expected it. In our honest opinion this is the most beautiful of the Cacti and we gave it the number 101, as compensation for the 101 salvos that we would willingly have fired into the air on finding it. This discovery alone is worth all the trials and troubles of the whole journey and it compensated us for all the previous privations. Since we found only a few plants suitable for transport at this place, we had to hunt still further, to see if we could find yet other localities.

The road to a spot where *Spegazzinia (Echinocactus) neumannii* should occur, which we after-

wards found elsewhere, was so incredibly bad that we took 2½ hours to do 10 km. with the lorry. Here we broke the front two springs, dented the exhaust pipe and broke all the lamp bulbs in the reflectors. Besides this, various screws were broken and the mud guards were put completely out of shape. We found instead of *Spegazzinia (Echinocactus) neumannii*, *Oreocereus trollii*, *Parodia? maassii*, and *Lobivia longispina*. In another place in the north of the province of Jujuy we found *Neowerdermannia vorwerkii* Fric. whose locality is given in the literature as Bolivia. The body of this species, as with many others, dries up in winter so completely that one might believe that the plants retire into the earth in winter where they are entirely buried by sand storms. We saw no trace of the plants till we accidentally discovered the fine spine tips, projecting slightly above the sand.

On our expeditions through the remote valleys in the extreme north of the Province of Jujuy and southern Bolivia we photographed several gigantic cristates of *Trichocereus pasacana*, of which some weighed up to one ton. These monsters with snow-white hair stand on the slopes of the mountains like a hand with outspread fingers on a mighty arm. But despite so many hundred snow-white giant columns, we sought in vain for small plants, less than 2 m. high and yet with the typical white bristles. All the young plants had close, long, brown spines. The reputed species *Trichocereus cephalopasacana* or *pasacana alba* owes its existence to the desire to add one more species to the catalogue. The seedlings of these two forms show no difference either in their native place or in cultivation in Europe, which would justify the setting up of a variety. In its native place one can be certain that in the high mountains and plateaux *Trichocereus pasacana*, as soon as it has reached a given age, will form white bristles, instead of the long, stout, brown spines of the young form. At lower levels and on the plains the formation of white bristles is entirely suppressed and the plant remains brown-spined even in old age. The cause of this phenomenon is so far quite unknown, as is the cause of the formation of fasciations and monstrous forms. With regard to these latter, we made in situ observations on a large number of cristates with the following results that possibly puts the cause of the deformation in another light. We found in all the cristates examined, traces of damage by insects, below the crest or in the crest itself. Usually there were tunnels as thick as a finger eaten out by insect larvae. The larvae themselves were often found in them. Often these were grey-green caterpillars, apparently of butterflies or whitish yellow

grubs of beetles, as thick as a finger. The walls of the holes were usually dry and covered with a reddish brown cork-like layer. The passages were filled with the brown excrement of the larvae. Often, however, the passages were decaying and we found, especially in some cristates of *Trichocereus pasacana*, a blackish brown slimy fluid outside on the crest, which ran from one of these nibbled passages or came from a large rotten spot. A broader, browner stripe in the once white hairs of the plant indicates that these decayed spots existed before the previous rainy period and that the fluid has been washed down by the rain thereby colouring the white bristles brown. Often such cristates were split and long cracks ran across and across their crests. Then we made the important observation that as a rule a number of cristates of the same species occur near together. Often even several shoots of a branching plant are affected. This occurred in *Trichocereus pasacana*, *Stetsonia coryne*, *Cleistocactus baumanni*, *Oreocereus celsianus*, *Gymnocalycium* (*Echinocactus*) *saglionis*, *G. schickendanzii* and *Opuntia ficus indica*. We only found solitary cristates of *Gymnocalycium* (*Echino-*



UPPER: Giant *Trichocereus pasacana* crestate north of Humahuaca. LOWER: A helpless stop in a hole of the Rio Blanca, Prov. Salta.



UPPER: *Pilocereus celsianus*. LOWER: *Lobivia andalgalensis*.

cactus) *chryscanthion*, *Parodia? maassii*, several *Rebutias*, *Lobivias* and a few species of *Echinopsis*.

From these observations it appears to me as if the cause of the formation of many, perhaps of all fasciations, can be traced back to the attacks of insects or other exterior damage. For only thus can one explain the considerable appearance of cristate forms in a small space and also on the limited power of flight of the insects. Apparently these insects use the same species of cactus on which to deposit their eggs, which served themselves as hosts. If it can be established that the few cristates found amongst seedlings owe their existence to accidental damage by tweezers during transplanting, in the right spot, or other similar damage, perhaps eating

by insects, then the formation of cristates would be finally explained.

The alkaloids recently discovered in cacti may be the reason why many species are not attacked by insects and therefore do not form cristates. Thus, for example, no cristate forms are found of *Oreocereus troltii*, of many species of the *Parodia* (*Echinocactus*) *microperma* group and of many *Echinopsis*, *Lobivias* and *Rebutias*. Cristates too are very rare in spherical *Opuntias*. We only found two crested plants of *Opuntia diademata* in the Province of La Rioja, the two plants being 2 m. apart. If these observations only contribute to the better understanding of the cause of the formation of cristates, yet the essential in the production of this deformation remains unexplained, namely what happens to the growing point in the crown, which so acts that the cell division does not take place equally in three directions, but only in two. For even if we have correctly established that attack by insect larvae is the cause of cristate formation, the problem has only gone one step forward and the question remains, how the fasciation is formed when the insect has eaten its tunnel through a normal stem. I believe that science alone is interested in the answer to this question, for when it is finally decided and when one can produce cristates in any required quantity, no one would be interested any longer in these peculiar plants, which are collected only on account of their rarity.

After we have travelled more than 5000 km. with the lorry in Argentina and southern Bolivia, hunting for Cacti, after we have made countless expeditions of foot, without the car, through pathless country or on mules, it is perhaps a good thing to recapitulate the results of this part of the trip. We have found more than 100 valuable cactus species, without counting the numerous species that we found, but which, on account of their low commercial value, we did not collect. Of *Lobivia*, *Rebutia* and *Echinopsis* alone we collected over 50 different species. Probably there are a number of good new things amongst them. It seems desirable to leave the journey to Bolivia and Peru until next year and to penetrate with mules into the interior of the quite pathless country of northwestern Argentina, which probably has not yet been traversed by a cactus collector, and here we hope to find new *Lobivias* and *Rebutias*. To have time for this task, we separated in July and Herr Marsoner carried out the trip to Paraguay planned for later on and in a month of collecting obtained valuable material. Amongst them were cacti from the Chaco Boreal, earlier the scene of war, where collecting is no longer possible, since the roads laid out for war purposes have quickly returned to their primeval

condition and therefore penetration into this region is quite impossible. The transport of these plants was attended with so much difficulty that he has earned a special description which I will keep till later. During this period I sorted the plant material in Jujuy and got everything ready for despatch and also found time to write this report and then to go on a collecting trip to the north of the Province of Jujuy and towards southern Bolivia. Through this division of labour we have found time to go far enough into the unexplored cactus regions of Northern Argentina where we expect a specially valuable booty.

In the meantime it is spring here in the southern hemisphere and it looks as if we shall not be so terribly frozen during our nights in the open. It also looks as if we shall have, at the end of this trip, to replace completely our torn linen, clothes and boots. We probably go on to Uruguay to collect there and then the journey will be continued through Bolivia and Peru and at the end we reach Brazil. Since in the northern hemisphere winter is now setting in, all plants that we collect henceforth will be planted out at a suitable spot and carefully tended till the end of February or beginning of March so that they can be sent off with the results of the collecting in Uruguay.

Following issues of the JOURNAL will contain:

What Grows Where by Anne Smith.

New Species of *Echinocereus* by Elzada U. Clover.

New variety of *Neomammillaria* by Yale Dawson.

An interesting article from Mr. Jack Whitehead of Boyce Thompson Southwestern Arboretum.

W. E. Lowry, Sr., of Laredo, Texas, an illustrated article.

Oklahoma Cacti by Jas. H. Hyde.

A new Species by Curt Backeberg.

Collecting Succulents in Mexico by Eric Walther.

Notes on Oklahoma Cacti by Marion Sherwood Lohman.

Illustrated issues are promised for this summer and some of the pictures will be in full color.

"Blühende Kakteen und andere Sukkulente Pflanzen" Mappe 25 and 26 contain natural color pictures of the following: *Opuntia clavarioides*, *Pleiospilos roodiæ*, *Rathbunia alamosensis*, *Rebutia oculata*, *R. spegazziniana*, *R. aureiflora*, *R. dasyphrisa* and *Lobivia jajoiana*. There has never been published a better collection of colored illustrations of succulents and these can be obtained from J. Neumann-Neudamm, Neudamm, Germany, for 16 RM per year which includes four portfolios of four pictures each.

Contrary to reports it is definitely stated by the Director of Kew Gardens that there will be no publication of the late Dr. N. E. Brown's uncompleted work except for an occasional completed description which might be found in the Herbarium.

Unbound issues of the Cactus Journal, Vol. I, (used) is offered at \$5. Write the Editor.

EDITORIAL

Your Editor submits herewith the first installment of a pronouncing and illustrated glossary of succulent terms. Several years ago H. O. Bullard discussed this matter with Boyd L. Sloane and this work would have appeared some time ago if Mr. Sloane had not taken up his well known work with *Stapelias*.

Ervin Strong of La Harbra was the first to start the work by compiling all of the botanical terms found in all four volumes of Britton and Rose. This in itself was no small undertaking and was a start in this work.

Wm. Taylor Marshall has undertaken the comple-

tion of this work and to him great credit should be given for his tireless work. As a student and collector, Mr. Marshall is well qualified for this undertaking which will supplement his classes in the study of cacti.

The pronouncing of terms is always a debatable point, but we have accepted the forms of best usage and if the majority will abide by these recommendations, this difficult in pronouncing will clarify itself and cactus students will be able to talk more intelligently regarding plants. Any terms not found in this list should be mailed to the Editor and it will be interesting to note how completely this list fills all requirements.

Glossary of Succulent Terms

A glossary of botanical terms and pronouncing vocabulary of generic and specific names used in connection with xerophytic plants.

By WM. TAYLOR MARSHALL

Drawn by Georgia Banks and Margaret Kincher

The very wide interest in Cactus and other succulents has resulted in the assembling of many fine collections of Xerophytic plants in the United States and the signs all point to a greatly increased interest on the part of collectors, as well as plant lovers generally.

This interest has called for literature on the subject which has been met by such books as Dr. A. D. Houghton's "The Cactus Book;" "California Cactus" by E. M. Baxter; "The Study of Cactus" by Vera Higgins, M.A.; "The Bulletin of Cactus Research" by Curt Backeberg; "Cactus" and "Succulents," both translated from the Dutch by E. J. Labarre, while written by A. J. Van Laren; "The Stapelieae" by Alain White and Boyd L. Sloane; and the reprint of Britton and Rose's monograph "The Cactaceae" by the Journal of Cactus and Succulent Society of America.

The literature has presented to us many new or unfamiliar botanical words, resulting in the need of a glossary that would supply the definition and pronunciation of these words and at the same time define the botanical names of the plants in which we are interested.

It was with this need in mind that this work was first attempted and the finished product is offered in the belief that it will prove helpful to students and collectors.

Only those words commonly used in connection with Xerophytic plants have been defined in this work thereby reducing its bulk and making for ease of reference.

In defining Generic and Specific names only those of the "descriptive" type are considered as

the types of names honoring the discoverer of the plant or a person interested in the plant or signifying the geographical point from which the plant was collected can be easily understood if the following simple rules are kept in mind:

Geographical names, while less desirable than descriptive names, may assist the student by suggesting the locality from which the plant originates and thereby give a hint at proper culture. Such names are formed by adding to the name of the City, Mountain Range, Desert or other locality the suffix "ensis" or "sanus." Thus the *Ferocactus* from the Alamos Mountains in Southern Sonora, Mexico, is called *Ferocactus alamosanus*, and the *Rathbunia* from Northern Sonora is *Rathbunia sonorensis*.

When plants are named in honor of the discoverer, the specific name is formed by adding to the discoverers name the suffix: "ii" or if the name ends in "er" or "en," a single "i" for the masculine and "a" or "ae" for the feminine. Thus the *Mamillaria* discovered by Mrs. F. M. Main is *Mamillaria mainae* and the one discovered by H. E. Gates is *Mamillaria gatesii*.

When plants are named for a person other than the discoverer the suffix "iana" is added to the person's name as: *Mamillaria baxteriana* or *Echinocereus salm-dyckianus*.

A specific name takes the form of an adjective and must agree in gender with the noun (Generic name) it qualifies; thus *Cereus papillosus* becomes *Wilcoxia papillosa*.

All generic names start with a capital letter and those used as a specific name are marked "S" for species.

A

a: prefix meaning "not," as *acaulescent*; not caulescent or not having a leafy stem above the ground.

ab: prefix meaning "from," as *abnormal*; from the normal.

aberrant: (ăb-ěr'-ant) unusual; exceptional; a variation from type or from customary structure.

abjecta: (ăb-jěk'-tă) low or decumbent. S.

aboriginal: (ăb'-ô-rîj-i-nal) the first; original; truly indigenous.

abortive: (ă-bôr'-tîv) imperfectly formed or developed; rudimentary; hence sterile.

abrupt: (ăb-rŭpt') suddenly terminating, as a leaf that narrows quickly to a point; not tapering; a pinnate leaf with no terminal leaflets.

abscission: (ăb-sîzh'ŭn) the natural separation of parts by disorganization of absciss layer.

absciss layer: (ăb-sîzh'-lă'ěr) a zone of tissue forming a layer of separation.

acalycalis: (ă-căl-ic'-ă-lîs) having no calyx.

acantha: (ă-kăn'thă) thorn or spine.

acanthocarpa: (ă-kăn'-thô-kăr' pă) with spiny fruit. S.

Acanthocereus (ă-kăn'-thô-sē'-rē-us) spiny *Cereus*; a genus of cacti.

acanthodes: (ă-kăn'-thô-dēs) very spiny. S.

Acanthorhipsalis: (ă-kăn'-thô-rîp'-să-lîs) a genus of spiny plants in *Rhipsaladanae*.

acarpotropic: (ă-kăr'po-trôp'-ic) not throwing off its fruits.



Acaulescent plant

acaulescent: (ăk-ô-lēs'-ënt) having no true stem or only a very short one concealed in the ground.

acaulon: (ă-kăw'-lôn) stemless. S.

acrescent: (ăk-rēs'-ënt) increasing in size or length with age as the calyx or pedicel after flowering.

accumbent: (ă-kŭm'-bënt) laying against something; as *accumbent cotyledons*.

acephalus: (ă-sěf'-ă-lŭs) without a head. S.

acerose: (ăs' ěr-ôs) having a sharp, rigid point; as the needle of a pine.

acerosus: (ăc-ěr-ô'sŭs) needle shaped.

aceous: (ă'-shŭs) a Latin suffix of resemblance; as *foliaceus*; meaning leaf-like.

achaenocarp: (ă-kăn'-ô-kărp) any dry, indehiscent (not opening along a definite line, see *dehiscent*) fruit.

achene: (ă-kēn) a small, dry, indehiscent one seeded fruit, having a thin pericarp.

achlamydeous: (ăk' lâ-mîd-ē-ŭs) without a perianth; said of certain apetalous (without petals) plants.



Acicular spines

acicular: (ă-sîk' ŭ-lăr) needle shaped.

acidotus: (ă-sî'-dô-tŭs) when branches or leaves end in a sharp point. S.

acidus: (ă'-sîd-ŭs) acid; sour.

acifer: (ăs'-îf-ěr) steely in color. S.

acinaciform: (ăs'-î-năs'-î-fôrm) shaped like a scimitar.



Acinaciform

aciniform: (ă-sîn'-î-fôrm) having the form of a cluster of grapes.

aciniformus: (ă-sîn'-î-fôrm-îs) in a cluster like grapes. S.

Ackermannia: (ăk-ěr-măn'-nî-ă) subgenus two of genus *twenty-two*, *Wittia*, of subfamily two of *Cactaceae* under *Backeberg's* classification B.

acotyledonous: (ă-kôt-î-lē-dŭn-ŭs) without seed leaves or cotyledons.

acroacanthus: (ăk'-rô-ă-kăn'-thŭs) without spines. S.

aculeate: (ă-kū'-lē-ăt) beset with prickles (aculei).



Acuminate

acuminate: (ă-kū'-mī-năt) tapering to a slender point.

acutangulis: (ă-kūt'-ăn-g'l-ūs) with sharp narrow ribs or wings. S.



Acute

acute: (ă-kūt') terminating sharply and abruptly, in an angle of less than ninety degrees.

acutifolius: (ă-kūt'-tī-fō'-lī-ūs) acutely leaved. S.

acutissimus: (ă-kūt'-tīs-ī-mūs) very sharp. S.

adenophorous (ăd-ě-nōf'er-ūs) bearing glands. S.

admirabilis: (ăd-mīr-ă'-bī-līs) admirable; noteworthy. S.

adnate: (ăd-năt') grown to; said of parts that are attached throughout their entire length to parts of a different series.

Adromischus: (ăd-rō'-mīs'-shūs) a genus of plants in the Cotyledon group of the family Crassulaceae.

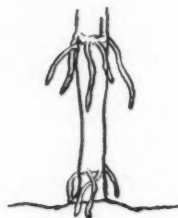
aduncus: (ă-dūn'-kūs) hooked. S.

adventitious: (ăd-věn-tish'-ūs) out of the usual place; as buds on leaves.

adynamandry: (ăd'-ī-nām'-ăn-drē) self sterility.

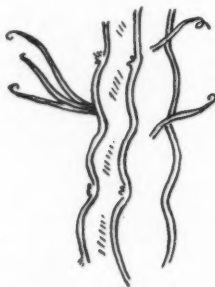
aeneus: (ă-ē'-nē-ūs) bronze colored. S.

Æonium: (ē'-ō-nī'-ūm) A genus of plants, mostly from the Canary Islands; the Sem-pervivums with stems.



Adventitious roots

aequilateralis: (ē'-kwī-lăt-ēr-ăl'-īs) of equal length; equal sided. S.



Aerial roots

aerial: (ă-ē'-rī-ăl) living above the ground; roots on stems above the ground as on the Hylocereanae.

aestivation: (ēs-tī-vă'-shūn) the relative arrangements or disposition of parts in a flower bud.

aethiops: (ē'-thē-ōps) black; usually referring to the spines. S.

affinis: (ă-fīn'-īs) related (to another species). S.

Agave: (ă-gă'-vē) Webster; (ă-gă'-vē) common usage. A genus of plants of the Amaryllis family; including the so called "Century Plant."

agavoides: (ă-gă'-vōi'-dēs) like an Agave. S.

agglomerate: (ă-glōm'-ēr-ăt) to gather into a mass; to cluster; heaped up.

agusticostatus: (ō'-gūs-tī-kōs'-tă-tūs) with notable ribs. S.

Aizoaceae: (ă'-ī-zō-ă'-sē-ē) literally "always alive;" the botanical family of herbs that includes the Mesembrianthema.

alamosanus: (ă'-lă-mō-săn-ūs) from Alamos. S.

alate: (ă-lăt') winged; having wings or wing-like parts.

alatus: (ă-lăt'-ūs) winged. S.

albescens: (ăl'-bē-sēns) becoming white. S.

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